

Temperature multi-function calibrator

Model CTM9100-150

WIKA data sheet CT 41.40

Applications

- Testing and calibration of all types of temperature measuring instruments
- Reference instrument for on-site laboratories for the calibration of thermometers
- Also suitable for on-site use

Special features

- Multi-function instrument with four controller parameter sets
- Calibration with an external reference
- Low weight and compact design
- Easy handling



**Temperature multi-function calibrator
model CTM9100-150**

Description

Versatile in application

Nowadays, fast and simple testing of thermometers is a “must” when it comes to the operational safety of machines and plants. The portable calibrators of the CTx9100 family are particularly suited for on-site calibration and are extremely user-friendly. Due to their compact design and low weight, the instruments can be used anywhere.

The use of a dry-well calibrator or micro calibration bath leads to a result that is not representative of actual use and is distorted during the calibration of surface thermometers or non-contact thermometers. In these cases, the model CTM9100-150 temperature multi-function calibrator should be used.

With this temperature multi-function calibrator in the temperature range from -20 ... +150 °C [-4 ... +302 °F], you can cover not only the conventional functions but, with special inserts, also use it as a surface temperature calibrator and an infrared black body.

Easy to use

The temperature multi-function calibrator combines four application possibilities in one instrument. The simple instrument design enables fast and easy switching between individual applications. The settings for each application are made using one of the four keys and the toggle switch on the front of the controller.

It is possible to calibrate nearly every thermometer with the different inserts, even contact (TC, Pt, surface) or non-contact (infrared) thermometers.

The calibration temperature can be easily set using two keys on the controller and is regulated in a very short time. The actual and set temperature are displayed simultaneously on a large 4-digit, high-contrast LED display. Thus reading errors are virtually eliminated.

Specifications

Basic information		
Temperature range	Application as:	
	Micro calibration bath	-30 ... +165 °C [-22 ... +329 °F]
	Dry-well calibrator Surface temperature calibrator Infrared black body	-20 ... +150 °C [-4 ... +302 °F]
Accuracy	Application as:	
	Micro calibration bath	±0.2 K
	Dry-well calibrator	±0.3 K
	Surface temperature calibrator Infrared black body	±1 K
	Defined the measuring deviation between the measured value and the reference value.	
Temperature stability	Application as:	
	Micro calibration bath Dry-well calibrator	±0.05 K
	Surface temperature calibrator Infrared black body	±0.2 K
	Maximum temperature difference at a stable temperature over 30 minutes.	
Temperature control		
Heating time	Depending on the application and area of application	
Cooling time	Depending on the application and area of application	
Stabilisation time	Depending on the application and area of application	
Metal block		
Immersion depth	150 mm [5.91 in]	
Dimension for calibration insert	Ø 60 x 170 mm [Ø 2.36 x 6.69 in]	
Dry-well material	Aluminium	
Digital display instrument		
Display	Two-row, 4-digit LED display	
Display range	-199.9 ... +999.9 °C [-199.9 ... +999.9 °F]	
Resolution	0.01 to 100 °C [212 °F] 0.1 > 100 °C [> 212 °F]	
Units	°C, °F	
Dimensions (W x D x H)		
Calibrator without carrying handle	215 x 305 x 425 mm [8.46 x 12.0 x 16.73 in]	
Height of carrying handle	50 mm [1.97 in]	
Weight	12 kg [26.5 lb]	

Communication	
Interface	RS-485 to USB 2.0
Communications protocol	Modbus® RTU
	→ Details and further possibilities on request
Baud rate	9600

Voltage supply and performance data	
Operating voltage	AC 100 ... 240 V, 50/60 Hz
Power consumption	400 VA

Voltage supply and performance data	
Fuse	Micro fuse, 6.3 A 250 V slow blow fuse
Power cord	■ Europe ■ USA/Canada ■ Switzerland ■ UK ■ China

Operating conditions	
Place of use	For indoor use only
Altitude	≤ 2,000 m [≤ 6,562 ft] above sea level
Operating temperature	0 ... 50 °C [32 ... 122 °F] The ambient temperature influences the heating/cooling behaviour
Storage and transport temperature range	-10 ... +60 °C [14 ... 140 °F]
Humidity	< 80 % to 31 °C [88 °F], decreasing linearly to 50 % at 40 °C [104 °F]
Condensation	Non-condensing
Electrical safety	
Overvoltage category	II
Pollution degree per IEC 61010-1	2

Approvals

Logo	Description	Region
	EU declaration of conformity	European Union
	EMC Directive EN 61326 emission (group 1, class B) and immunity (industrial environment)	
	Low Voltage Directive EN 61010, safety requirements for electrical equipment for measurement, control and laboratory use	
	RoHS directive	

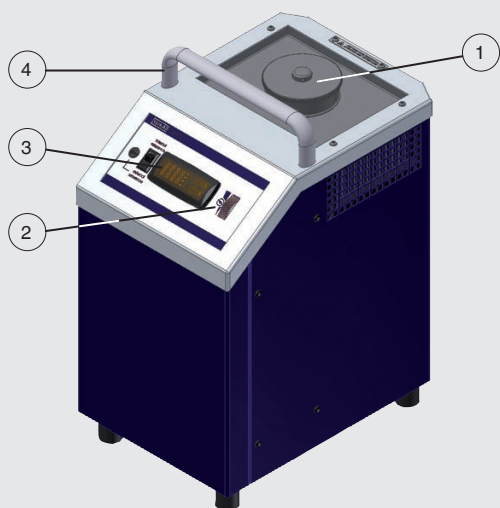
Certificates

Description	
Calibration	■ 3.1 inspection certificate per EN 10204 ■ DAkkS calibration certificate for micro calibration bath (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate as temperature dry-well calibrator (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate for micro calibration bath and temperature dry-well calibrator (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	1 year (dependent on conditions of use)

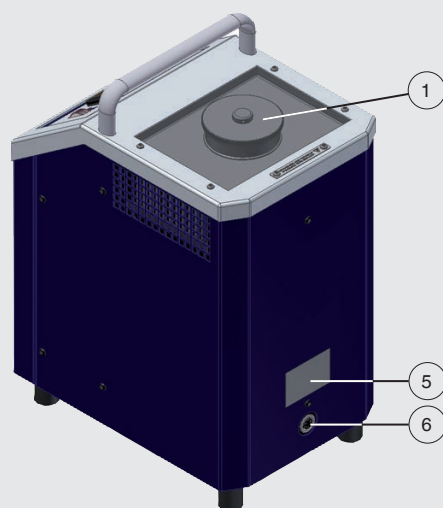
→ For approvals and certificates, see website

Isometric views

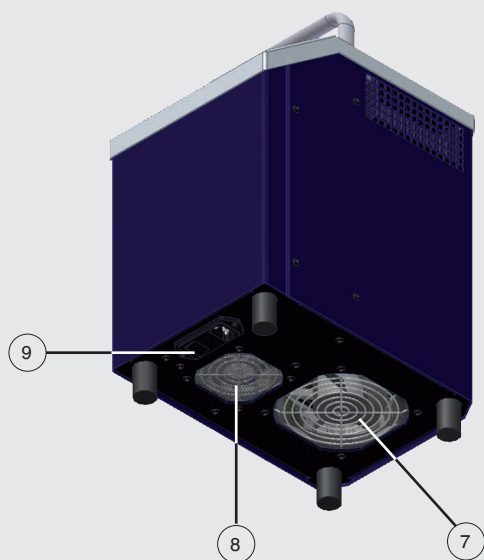
View from the front



View from the rear



View from below



- ① Temperature dry well
- ② Controller for the stirrer
- ③ Digital display with controller
- ④ Carrying handle
- ⑤ Product label
- ⑥ RS-485 interfaces
- ⑦ Fan 1: ventilation for tank or temperature dry well cooling
- ⑧ Fan 2: ventilation for case cooling
- ⑨ Mains connection socket with main switch and microfuse

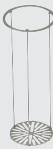
Accessories and their applications

The function of the calibrator is determined by the insert. The required insert is inserted into the opening of the metal block or tank.
This makes it easy to switch between dry well, infrared, surface and micro calibration bath functions.

Description ¹⁾	
Inserts	
The insert has several bores into which the temperature probes being calibrated and one additional reference thermometer for comparative calibration. The block is either heated or cooled to the desired calibration temperature. Once a stable temperature has been reached, the temperature probes to be calibrated can be compared with the reference thermometer. The documentation of this comparison represents the calibration.	
Insert for surface measurement	
The calibration of surface temperature probes is very difficult and not without controversy. Temperature probes mounted on surfaces dissipate heat from the surface and create a cold zone on the surface being measured. In the temperature-multi-function calibrator, the calibration temperature is created in a specially designed surface insert and measured directly under the surface by a reference thermometer.	
Insert for infrared measurement	
The measuring spot of the pyrometer being calibrated must be smaller than the diameter of the infrared insert. The sleeve has been specifically manufactured with regard to its design and surface in order to achieve a defined emissivity for the measurement. Fit the hollow and specially designed insert into the block using a special replacement tool. The sleeve also has three bores in the edge with 2 x 3.5 mm and 1 x 4.5 mm [2 x 0.14 in and 1 x 0.18 in], for the accurate monitoring of the temperature via external reference probes. The insert has a special design and surface finish on the inside. Through this, an emissivity of 0.9994 (black body) is achieved.	
Insert for liquids and probe basket for tank	
Angled probes, large-diameter probes or probes with special designs cannot be calibrated with a dry-well calibrator. For this reason, the temperature multi-function calibrator also has the possibility to function as a stirred liquid bath. The liquid is circulated using a magnetic stirrer, and thus provides very good temperature distribution within the bath. The liquids used are selected depending upon the desired calibration temperature.	
Reference thermometer	
Angled temperature probes are supplied to match the insert.	

1) The figures are examples and may change in design, material composition and representation depending on the state of the art

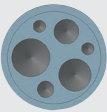
Accessories and spare parts

Accessories for model CTM9100-150		Order code
Description ¹⁾		CTX-A-K0
	Transport case	-TC-
	Castors for transport case	-CC-
	Insert replacement tool	-RT-
-	Insert replacement tool For insert for surface measurement	-BS-
-	Drain pump	-EP-
	Standard sleeve for the surface measurement mode Dimension: Ø 60 x 205 mm [Ø 2.36 x 8.07 in] Material: aluminium 3.4365	-SO-
	Standard sleeve for the infrared measurement mode Dimension: Ø 60 x 150 mm [Ø 2.36 x 5.91 in] Material: aluminium 3.4365	-SI-
	Standard sleeve for the operating mode as temperature dry-well calibrator Dimension: Ø 60 x 150 mm [Ø 2.36 x 5.91 in] Material: aluminium 3.4365	-SD-
	DC 200.10 silicone oil In 1-litre plastic bottle For temperature range -35 ... +160 °C [-31 ... +320 °F]; FP = 163 °C [325.4 °F]	-10-
	Insert for liquids without filling Consists of: beaker with leak-proof lid, probe basket, magnetic stirrer and lifter, replacement tool  New adjustment required!	-BE-
	Probe basket Height-adjustable	-SK-
-	Probe holder For cooling instruments of the CTD9xxx series	-FL-

Accessories for model CTM9100-150		Order code
Description ¹⁾		CTX-A-K0
	Screw-on lid Material: stainless steel	-LM-
	Screw-on lid Material: plastic	-LP-
	Screw-on lid Material: plastic With bore 1 x G 1/2	-L1-
	Screw-on lid Material: plastic With 6 x G 1/4 bores	-L6-
-	Magnetic stirrer  Not suitable for insert for liquids!	-MS-
-	Operating instructions English-German	-MN-
-	Interface cable With integrated RS-485 to USB 2.0 converter	-RC-
	Power cord For EU	-EU-
	For Switzerland	-CH-
	For UK	-UK-
	For USA/Canada	-US-
Ordering information for the enquiry:		
1. Order code: CTX-A-K0 2. Option:		↓ []

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Inserts for model CTM9100-150		Order code
Description ¹⁾		CTA9I-1M
	Undrilled insert Dimension: Ø 60 x 150 mm [Ø 2.36 x 6.69 in] Material: aluminium	-N-
	Drilled insert Dimension: Ø 60 x 150 mm [Ø 2.36 x 6.69 in] Drilling depth: 145 mm [5.71 in] Material: aluminium	
	For thermometers to Ø 1.2 mm [0.05 in] Bore diameter: 1 x 1.5 mm [0.06 in]	-1-
	For thermometers to Ø 1.6 mm [0.07 in] Bore diameter: 1 x 2.0 mm [0.08 in]	-2-
	For thermometers to Ø 2.7 mm [0.11 in] Bore diameter: 1 x 3.0 mm [0.12 in]	-3-
	For thermometers to Ø 3.2 mm [0.13 in] Bore diameter: 1 x 3.5 mm [0.14 in]	-4-

Inserts for model CTM9100-150		Order code
Description ¹⁾		CTA9I-1M
	For thermometers to Ø 4.7 mm [0.19 in] Bore diameter: 1 x 5.0 mm [0.20 in]	-5-
	For thermometers to Ø 6.3 mm [0.25 in] Bore diameter: 1 x 6.5 mm [0.26 in]	-6-
	For thermometers to Ø 7.2 mm [0.28 in] Bore diameter: 1 x 7.5 mm [0.30 in]	-7-
	For thermometers to Ø 8.2 mm [0.32 in] Bore diameter: 1 x 8.5 mm [0.33 in]	-8-
	For thermometers to Ø 9.5 mm [0.37 in] Bore diameter: 1 x 10 mm [0.39 in]	-9-
	For thermometers to Ø 3.2 mm [0.13 in] Bore diameter: 1 x 5 mm and 1 x 3.5 mm [1 x 0.20 in and 1 x 0.14 in]	-I-
	For thermometers to Ø 6.3 mm [0.25 in] Bore diameter: 1 x 5 mm and 1 x 6.5 mm [1 x 0.20 in and 1 x 0.26 in]	-X-
	Bore diameter: 1 x 3.2 mm and 1 x 6.3 mm [1 x 0.13 in and 1 x 0.25 in]	-A-
	Bore diameter: 2 x 3.2 mm, 1 x 4.2 mm, 1 x 6.3 mm, 1 x 8.4 mm and 1 x 9.9 mm [2 x 0.13 in, 1 x 0.17 in, 1 x 0.25 in, 1 x 0.33 in and 1 x 0.39 in]	-B-
	Bore diameter: 2 x 3.2 mm, 2 x 4.3 mm, 3 x 6.3 mm and 2 x 8.5 mm [2 x 0.13 in, 2 x 0.17 in, 3 x 0.25 in and 2 x 0.33 in]	-M-
	Bore diameter: 1 x 2.0 mm, 3 x 3.2 mm, 2 x 4.3 mm, 1 x 5.0 mm and 2 x 6.5 mm [1 x 0.08 in, 3 x 0.13 in, 2 x 0.17 in, 1 x 0.2 in and 2 x 0.26 in]	-Y-
-	Customer-specific special probes available on request.	-?-
	Insert replacement tool	-J-
Ordering information for the enquiry:		
1. Order code: CTA9I-K 2. Option:		↓ []

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Scope of delivery

- Temperature multi-function calibrator
model CTM9100-150
- Power cord 1.5 m [5 ft]
- Insert with nine bores: Ø 1 x 2.0 mm, 3 x 3.2 mm,
2 x 4.3 mm, 1 x 5.0 mm and 2 x 6.5 mm [1 x 0.08 in,
3 x 0.13 in, 2 x 0.17 in, 1 x 0.2 in and 2 x 0.26 in]
- Surface insert
- Infrared insert
- Calibration liquid and drain pump
- External reference (angled)
- Replacement tools
- Operating instructions
- Calibration certificate

Ordering information

Model / Unit / Insert for liquids / Calibration / Transport case / Serial interface converter / Power cord / Additional ordering information

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